

### ABSTRACT

The present invention relates to a method for identifying a nucleotide at a predetermined location on a target polynucleotide. The method involves single nucleotide extension reaction comprising an oligonucleotide primer comprising a first sequence and a  
5 second sequence or a tag. The method may further comprises a probe which hybridizes to the second sequence or an anti-tag molecule which interacts with the tag, where the hybridization or interaction causes a detectable signal transfer which is indicative of the identity of the nucleotide base at the predetermined location. The invention further provides compositions and kits for performing the subject method of the invention.

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